



Questions

Unit (1)

(1) Complete the following:

- 1) Nitrogen pentoxide breaks up into and gas.
- 2) At the beginning of the reaction, the concentration of reactants is
.....
- 3) The speed of a chemical reaction can be measured practically by the rate of of reactants or the rate of of resultants.
- 4) The change in the concentration of reactants and resultants in a time unit is
- 5) The rate of chemical reaction depends on,, and
- 6) The reaction of contributing compounds is
- 7) The increase in concentration of reactants makes the chemical reaction
.....
- 8) A substance which increases the chemical reaction without sharing in the reaction is
- 9) $2\text{NaOH} + \text{CuSO}_4 \rightarrow \dots + \dots$
- 10) $\text{Fe} + 2\text{HCl} \rightarrow \dots + \dots$
- 11) $2\text{N}_2\text{O}_5 \rightarrow \dots + \dots$

(2) Give reasons for:

- 1) The speed of chemical reaction increases when the amount of the reactants increases.
- 2) Food must be heated during its preparation.
- 3) Food goes rotten in summer days if it is not frozen.



(3) How can you differentiate between:

Sodium chloride solution and sodium hydroxide solution (by two different methods)

(4) Mention the function of:

- 1- refrigerator 2- Enzymes

(5) Complete the following:

- 1- is the mixture that is homogenous in and properties.
- 2- It is possible to dissolve more solute in the solution.
- 3- An excess of the solute cannot be dissolved in solution.
- 4- The amount of the solute in saturated solution is than that in super-saturated solution.
- 5- The aqueous solution of an acid contains ions, while that of a base contains ions.
- 6- Acids change the litmus paper into
- 7- Acids react with to give and water.
- 8- Most bases have feel like
- 9- acid is produced in human muscles during physical exercises.
- 10- Calcium carbonates is used in the manufacture of and
- 11- Silve nitrates are used in the manufacture of sensitive

(6) Mention one use for each:

- 1- Hydrochloric acid
- 2- Magnesium hydroxide

**(7) Give reason for:**

- 1- Sodium and potassium minerals have a role in the human body.
- 2- The green leaves of vegetables have a great benefit.
- 3- The molten of coinage metals is considered as a type of solution.
- 4- The rheostat are used in the electric circuit.

(8) Define:

- Ohm's law

(9) What's meant by:

- A work of 10 joules is done to transfer a charge of 5 coulombs between two points.

(10) Solve: If the quantity of electricity of 12 coulombs passes through a cross-section of a conductor in 3 seconds, what is the intensity of the current passing through that conductor?



Unit (2)

(1) Complete:

- 1- The current intensity due to the flow of 2700 coulomb in 300 second through a cross-section of a conductor equals
- 2- In the electric circuits, the ammeter is connected in, while the voltmeter is connected in
- 3- Volt = $\frac{\text{joule}}{\dots \times \text{second}}$
- 4- There are two types of electric current which are and
- 5- The electric current can be transported only to short distance.
- 6- There are two methods of connecting electric cells which are and
- 7-, and cesium are natural radioactive elements.
- 8- Nuclear energy is used in medicine in and of some diseases.

(2) Write the scientific terms:

- 1- The flow of electric negative charges in a conducting material (metal wire). (.....)
- 2- A device used to measure the electric current intensity. (.....)
- 3- The work done to transfer unit of electric charge between two ends of a conductor. (.....)
- 4- The opposition to the flow of electric current in the conductor. (.....)



- 5- The potential difference across the two poles of the battery when the circuit is opened. (.....)

6- The electric current of constant intensity and direction. (.....)

7- A type of connection of electric cells used to obtain high e.m.f. (.....)

8- The process of conversion of atoms of some elements to reach more stability. (.....)

9- The changes that take place to the living organism due to its exposure to radiations. (.....)

(3) Choose the correct answer:



7- In the simple cell the energy is converted into electric energy.

- a) kinetic
- b) magnetic
- c) chemical
- d) mechanical

8- In dynamo, energy is converted into electric energy.

- a) magnetic
- b) kinetic
- c) chemical
- d) light

9- Alternating current is used in

- a) electrolysis
- b) lighting house
- c) electroplating
- d) both a & c

10- Radioactive phenomenon was discovered by the scientist

- a) ohm
- b) Becquerel
- c) Ampere
- d) volt

11- Rockets use fuel for flying

- a) gasoline
- b) kerosene
- c) natural gas
- d) nuclear

12- The measuring unit of the absorbed radiation is the

- a) curie
- b) rem
- c) Rontgen
- d) ohm

(4) Give reasons for:

1- It is better to use alternating current rather than direct current.

2- The voltmeter is connected across the two poles of a battery.

3- Rheostat is used in some electric circuits.

4- Some cells are connected in electric circuit in series.

5- Some cells are connected in the electric circuit in parallel.

6- e.m.f. of battery whose cells are connected in series is greater than that connected in parallel.

7- Some elements are called radioactive elements.

8- Radiation has genetic effect.



(5) Problems:

- 1- Calculate the electric current intensity that flows through cross section of a wire, if a charge of 10 coulombs passes through in 2 seconds.
- 2- Calculate the current intensity due to the flow of 5400 coulomb in 5 min. through a cross-section of a conductor.
- 3- What is the quantity of electricity which passes through a conductor its resistance 100 ohm for 30 minutes when the potential difference across its ends is 220 volts.
- 4- You have three similar cells, the electromotive force of each is 1.5 volt. Explain by using a diagram how you can connect them to obtain an e.m.f of:
 - a) 1.5 volts
 - b) 3 volts
 - c) 4.5 volts



Unit (3, 4)

(1) Complete:

- 1- traits are not transmitted from one generation to another.
- 2- The scientist is the founder of heredity, he used the seeds of plant, because its flowers are and thus it can self-pollinated.
- 3- The trait that appears in all individuals of the first generation in Mendel's experiments is trait.
- 4- Chromosome is chemically composed of a nucleic acid called which is combined with
- 5- The two scientists and were able to make a model for DNA molecule.
- 6- In DNA molecule, the nitrogenous base, Guanine pairs with base.
- 7- The gene mutation occurs as a result of the change in the sequence of of the gene.
- 8- Hormones are directly secreted into the blood stream by
- 9- gland secretes hormone which controls the general growth of the body.
- 10- Thyroxin is a that regulates food assimilation in your body.



(2) Write the scientific term:

- 1- The traits ready to be transmitted from one generation to another.
(.....)
- 2- The trait that appears in all individuals of the first generation in Mendel's experiments.
(.....)
- 3- The hereditary factors which transmit traits from the parents to offspring.
(.....)
- 4- Through which the hereditary traits are transmitted from parents to offspring.
(.....)
- 5- Parts of DNA that are present on the chromosomes and carry the hereditary traits of the individual.
(.....)
- 6- It is chemically consisted of a nucleic acid called DNA combined with protein.
(.....)
- 7- The mutations which are controlled by human to obtain desirable traits in specific living organisms and specially in the plants.
(.....)
- 8- Organs secreting hormones in the human body.
(.....)
- 9- A chemical message that controls and regulates the activities and functions of most of the body organs.
(.....)
- 10- Hormone which stimulates the storage of glucose sugar level in the blood.
(.....)
- 11- The result when one of the endocrine glands does not act properly.
(.....)



(3) Choose the correct answers:

- 1- Mendel conducted his experiments in pea plant by using pairs of traits.
a) 5 b) 7 c) 9 d) 11
- 3- The two factors of a hereditary trait are similar in the individual.
a) pure b) hybrid c) recessive d) a and c
- 4- Which one of these traits is recessive in humans
a) curly hair b) wide eyes c) free ear lobe d) straight hair
- 5- put the model of DNA molecule.
a) ohm b) Mendel c) Watson d) Johansson
- 6- is the part of DNA in the cell nucleus.
a) Gene b) Gamete c) Cytoplasm d) no correct answer
- 7- DNA molecule consists of strands.
a) two b) three c) four d) five
- 8- The mice don't have melanin pigment.
a) grey b) white c) black d) brown
- 9- The hormone which regulates the level of calcium in the blood is the hormone.
a) calitonin b) thyroxin c) progesterone d) adrenalin
- 10- The hormone liberates the needed energy from the food stuff.
a) growth b) estrogen
c) thyroxin d) testosterone
- 11- Glucagon hormone is secreted by
a) pituitary gland b) thyroid gland
c) adrenal gland d) pancreas



(4) Give reasons for:

- 1- Mendel selected (choose) the pea plant to conduct his experiments.
- 2- The curly hair dominates the smooth hair trait.
- 3- The ability of rolling the tongue is dominant trait in the human being.
- 4- The free ear lobe is dominant over the attached ear lobe.
- 5- DNA molecule is called the double helix.
- 6- Some mutations are not transmitted from a generation to another.
- 7- We must not be exposed to radiation as x-rays.
- 8- Blood stream is the only way for hormones to reach their sites of action.
- 9- Pituitary gland is called the master gland.
- 10- The stopping of the body growth, so the person becomes a dwarf.
- 11- Pancreas is a double function gland.
- 12- Diabetes disease is treated with insulin hormone.

(5) Problems:

- 1- In pea plant, what are the results of self-pollination of tall hybrid plant pure, by using the symbols (T, t) showing (parents – gametes – offspring).
- 2- Using symbols to express the results of mating between a short stemmed pea plant (tt) and a long stemmed pea plant (TT)
- 3- If a black mouse BB is crossed to a brown female mouse (bb) mention the colours and the ratios of resulting offspring in the first generation and second generation illustrated on hereditary basis.
- 4- When a pea plant that has tall stem is crossed with a pea plant that has short stem, this crossing produced individuals with the ratio of 50% tall : 50 % short what is the genetic structure of parents and producing individuals (use “T” for tall “t” for short)



Model Answers

(1) Complete the following:

- 1) Nitrogen pentoxide breaks up into **nitrogen dioxide** and **oxygen** gas.
- 2) At the beginning of the reaction, the concentration of reactants is **100%**.
- 3) The speed of a chemical reaction can be measured practically by the rate of **disappearance** of reactants or the rate of **appearance** of resultants.
- 4) The change in the concentration of reactants and resultants in a time unit is **the speed of chemical reaction**.
- 5) The rate of chemical reaction depends on **temperature**, **catalysts**, **concentration of reactants** and **nature of reactants**.
- 6) The reaction of contributing compounds is **slow**.
- 7) The increase in concentration of reactants makes the chemical reaction **faster**.
- 8) A substance which increases the chemical reaction without sharing in the reaction is **catalyst**.
- 9) $2\text{NaOH} + \text{CuSO}_4 \rightarrow \text{Na}_2\text{SO}_4 + \text{Cu}(\text{OH})_2 \downarrow$
- 10) $\text{Fe} + 2\text{HCl} \rightarrow \text{FeCl}_2 + \text{H}_2\uparrow$
- 11) $2\text{N}_2\text{O}_5 \rightarrow 4\text{NO}_2 + \text{O}_2\uparrow$

(2) Give reasons for:

- 1) The speed of chemical reaction increases when the amount of the reactants increases.
Due to the increase in the number of collision between molecules.
- 2) Food must be heated during its preparation.
To increase the speed of chemical reaction which help in cooking of food.
- 3) Food goes rotten in summer days if it is not frozen.
Due to the increase of the speed of chemical reaction done by bacteria.



(3) How can you differentiate between:

Sodium chloride solution and sodium hydroxide solution (by two different methods)

The first method: by adding silver nitrate solution if white ppt. is formed.

∴ the solution is sodium chloride:



The second method: by adding copper sulphate solution if blue ppt is formed.

∴ the solution is sodium hydroxide:



(4) Mention the function of:

1- **refrigerator** : preservation of food

2- **Enzymes** : they control digestion of food

(5) Complete the following:

- 1- **Solution** is the mixture that is homogenous in **composition** and properties.
- 2- It is possible to dissolve more solute in the **unsaturated** solution.
- 3- An excess of the solute cannot be dissolved in **saturated** solution.
- 4- The amount of the solute in saturated solution is **less** than that in super-saturated solution.
- 5- The aqueous solution of an acid contains **H⁺** ions, while that of a base contains **OH⁻** ions.
- 6- Acids change the **blue** litmus paper into **red**.
- 7- Acids react with **bases** to give **salt** and water.
- 8- Most bases have **soapy** feel like **NaOH**.
- 9- **Lactic** acid is produced in human muscles during physical exercises.
- 10- Calcium carbonates is used in the manufacture of **glass** and **cement**.
- 11- Silver nitrates are used in the manufacture of sensitive **camera film**.



(6) Mention one use for each:

- 1- **Hydrochloric acid:** in detergents and polishing metals surfaces needed to be coated
- 2- **Magnesium hydroxide:** in the manufacture of antacids.

(7) Give reason for:

- 1- Sodium and potassium minerals have a role in the human body.
Because they are responsible for the transfer of nerve impulses.
- 2- The green leaves of vegetables have a great benefit.
Because they contain folic acid which is necessary for the proper growth of cells.
- 3- The molten of coinage metals is considered as a type of solution.
Because the coin is an alloy of copper dissolved in silver in a homogenous form.
- 4- The rheostat are used in the electric circuit.
To control the electric current intensity flowing through the circuit.

(8) Define:

Ohm's law: the electric current intensity passing through a conductor is directly proportional to the potential difference across it at constant temperature.

(9) What's meant by:

- This means that the potential difference across the two points equals
 $10 / 5 = 2 \text{ volt}$

(10) $I = \frac{q}{t} = \frac{12}{3} = 4 \text{ amperes.}$



Unit (2)

(1) Complete:

1- 13.5 Amp.

2- series, parallel

3- volt = $\frac{\text{joule}}{\text{coilomb} \times \text{second}}$

4- direct – alternating

5- direct

6- series – parallel

7- radium, uranium

8- treat & diagnose diseases

(2) Write the scientific terms:

1- electric current

2- Ammeter

3- potential difference

4- resistance

5- e.m.f

6- direct electric current

7- series connection

8- radioactivity

9- mutation

(3)

1 – (c)

2 – (a)

3 – (a)

4 – (a)

5 – (b)

6 – (a)

7 – (c)

8 – (b)

9 – (b)

10 – (b)

11 – (d)

12 – (b)

(4) Give reasons for:

1- because it can be transferred to long distances & can be converted to direct current.

2- To measure e.m.f. of battery.

3- To control the current intensity passing through the circuit & potential difference by changing the resistance.



- 4- To obtain high e.m.f
- 5- To obtain low e.m.f.
- 6- because the total e.m.f. for a group of cells connecting in series is equal to the sum of the e.m.f for these cells, while the total e.m.f for a group of cells connecting in parallel is equal to the e.m.f of one cell.
- 7- because their nucleus contain number of neutrons more than that required for its stability.
- 8- because it changes sex chromosomes composition results in abnormal birth.

(5)

$$1) q = 10 \text{ coulombs} \quad t = 2 \text{ sec.}$$

$$I = \frac{q}{t} = \frac{10}{2} = 5 \text{ Ampere.}$$

$$2) = 5400 \text{ colomb} \quad t = 5 \times 60 = 300 \text{ sec.}$$

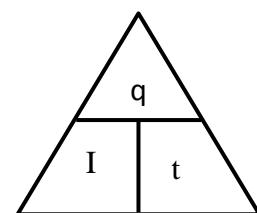
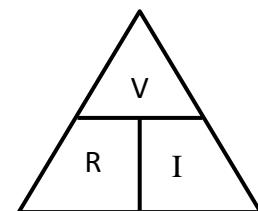
$$I = \frac{q}{t} = \frac{5400}{300} = 18 \text{ Ampere.}$$

$$3) R = 100 \text{ ohm} \quad , t = 30 \times 60 = 180 \text{ sec.}$$

$$, V = 220 \text{ v} , R = \frac{V}{I} , I = \frac{V}{R}$$

$$\therefore I = \frac{220}{100} = 2.2 \text{ Ampere.}$$

$$\begin{aligned} \because q &= I \times t \\ &= 2.2 \times 1800 \\ &= 3960 \text{ coulomb.} \end{aligned}$$





(Unit 3 , 4)

(1)

- 1 – Acquired .
- 2 – Mendel , Peapplant , hermaphodite .
- 3 – Dominant .
- 4 – DNA , protien .
- 5 – Watson & creck .
- 6 – Cytosine (c) .
- 7 – nitrogeueus bases .
- 8 – endocrine glands .
- 9 – Pituitary – growth .
- 10 – Thyroxine hormone .
- 11 – hormone .

(2)

- | | |
|-------------------------|----------------------------------|
| 1 – Hereditary traits . | 2 – Dominant trait . |
| 3 – genes . | 4 – hereditany factor (genes). |
| 5 – genes . | 6 – chromosomes . |
| 7 – Induced mution . | 8 – endocrine glands . |
| 9 – hormone . | 10 – Insulin . |
| 11 – hormone disorder . | |

(3)

- | | | |
|------------|-----------|---------------------|
| 1 – 7 | 2 – pure | 3 – straight hair . |
| 5 – watson | 6 – Gene | 7 – 2 |
| 8 – white | 9 – (a) | 10 – (c) |
| 11 – (d) | | |